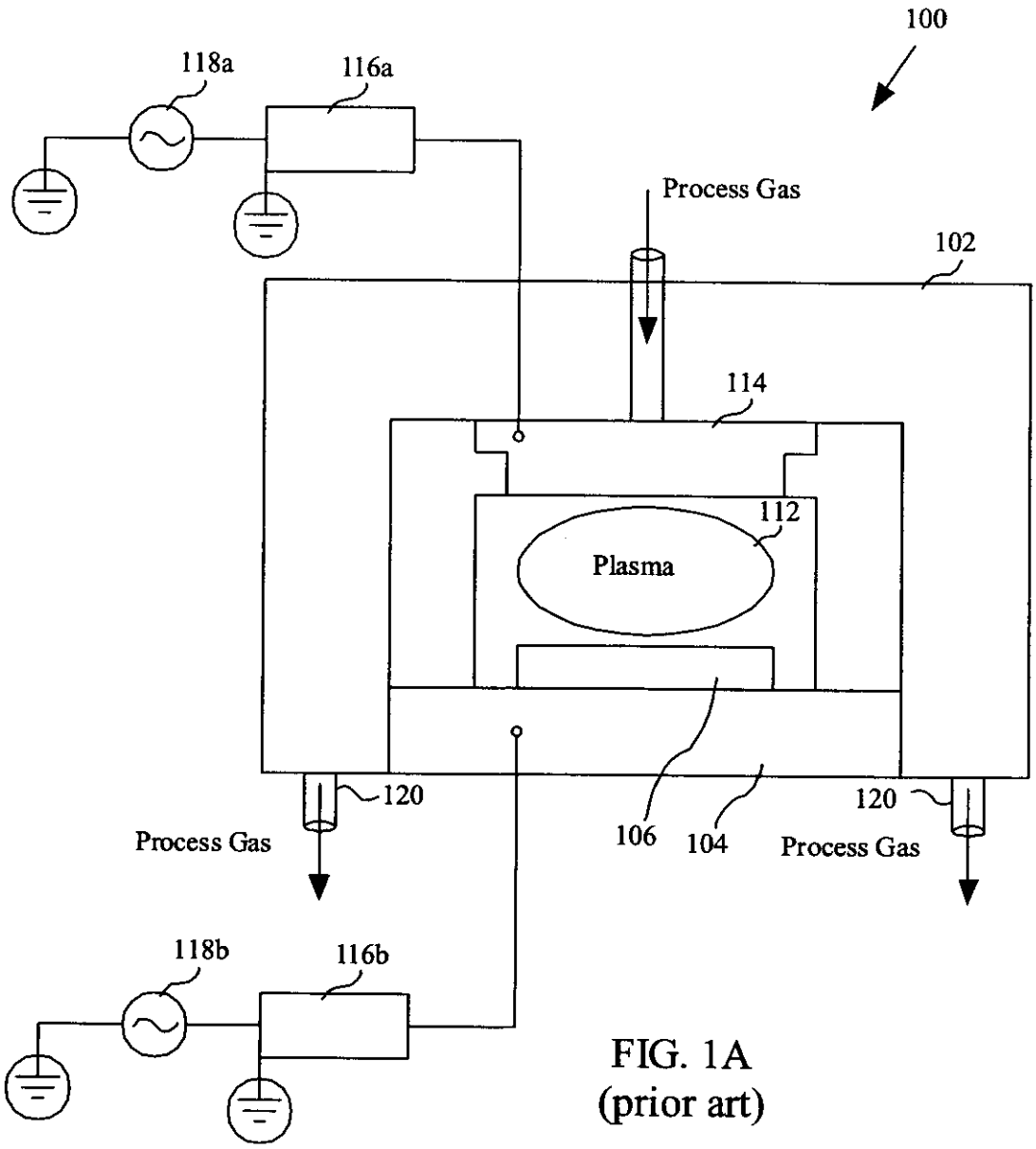



FIG. 1A
(prior art)

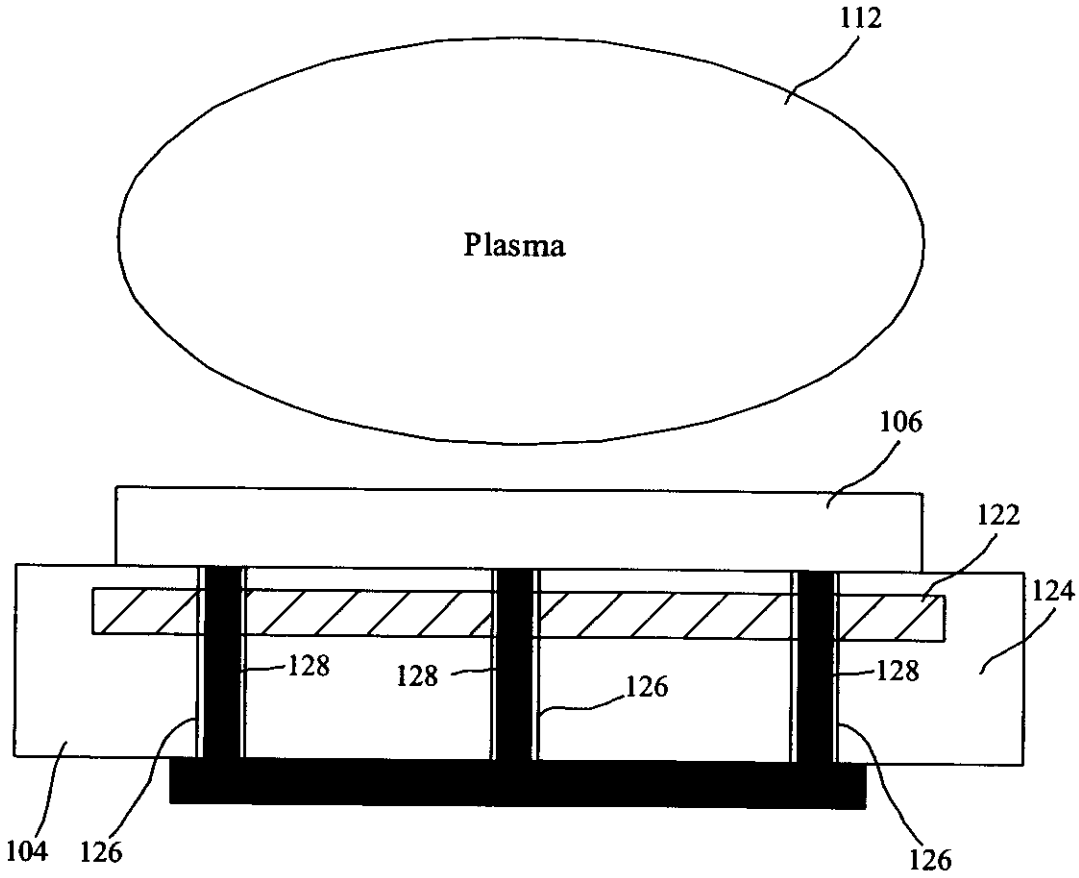



FIG. 1B
(prior art)

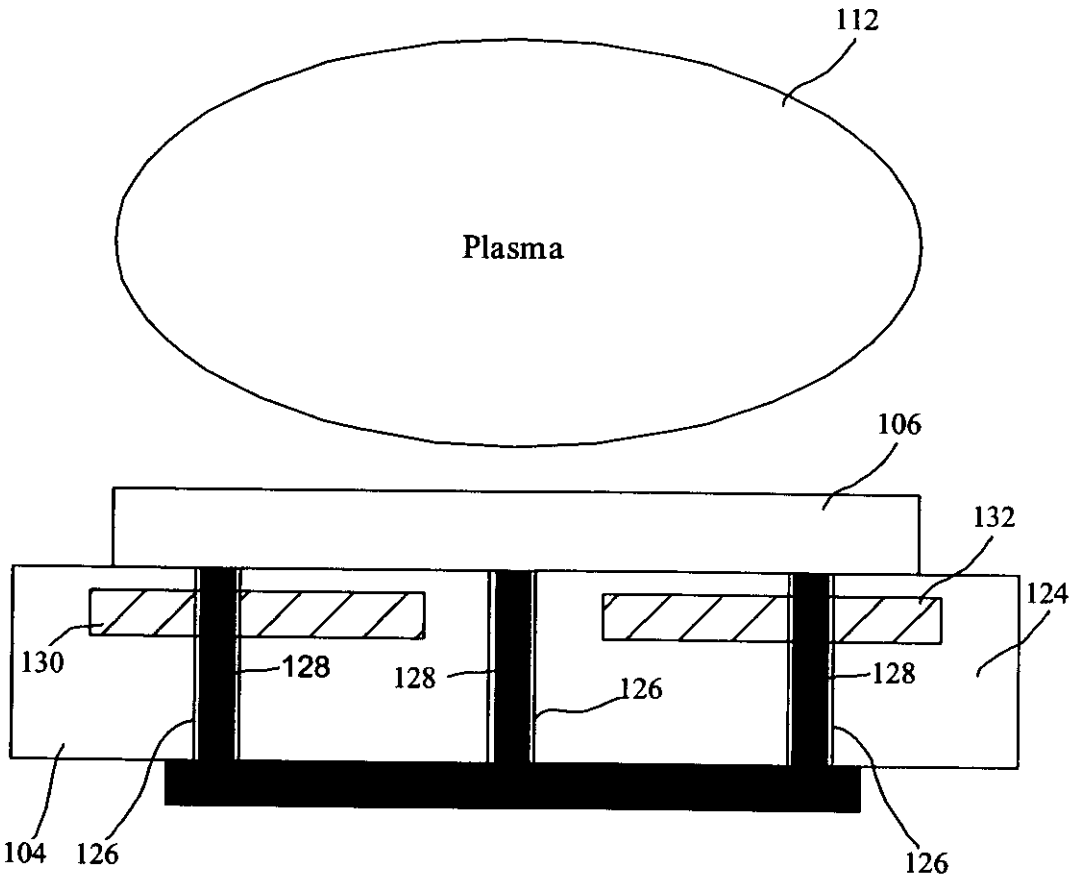



FIG. 1C
(prior art)

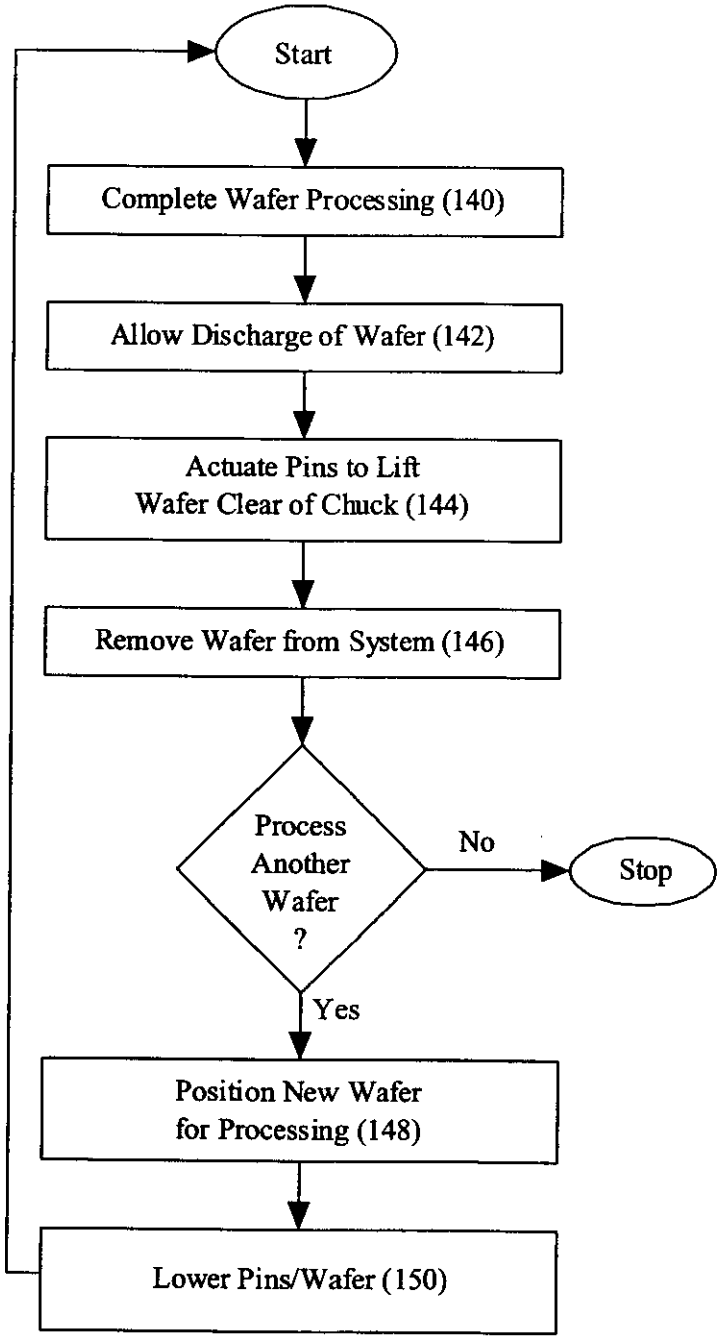



FIG. 1D
(prior art)

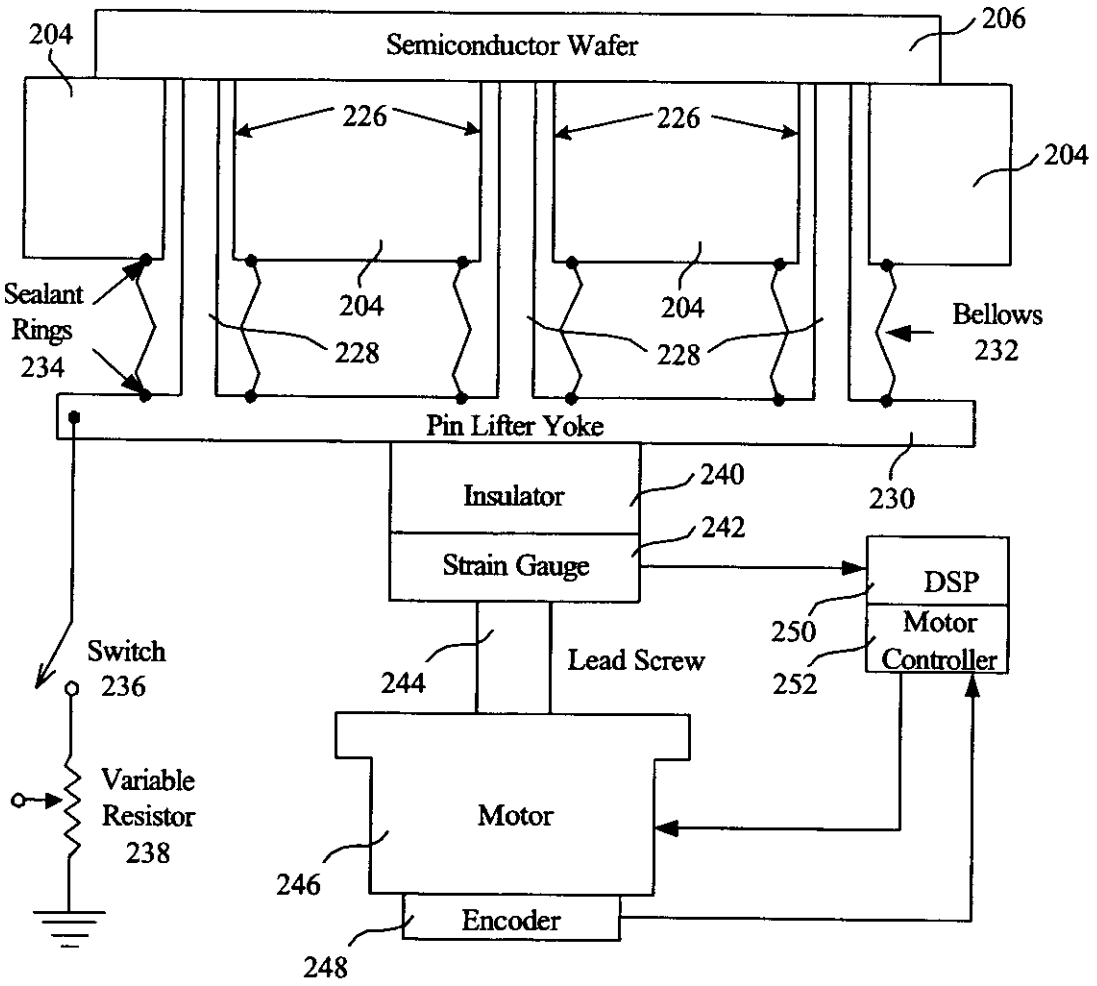

204
Semiconductor Wafer
206
226
226
204
Sealant
Rings
234
204
204
228
228
Bellows
232
Pin Lifter Yoke
Insulator
240
230
Strain Gauge
242
DSP
250
Motor
Controller
252
Switch
236
244
Lead Screw
Variable
Resistor
238
Motor
246
Encoder
248

FIG. 2A

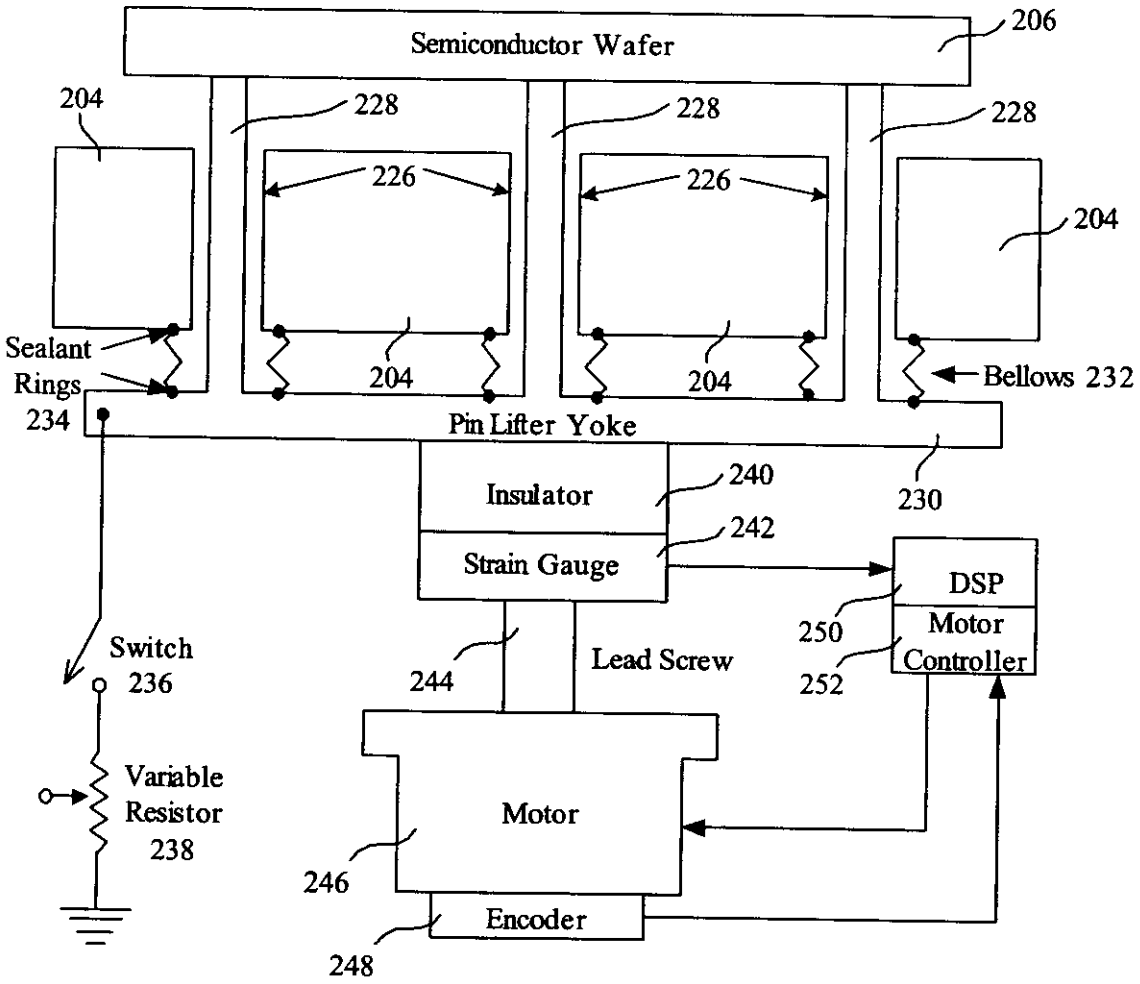

Semiconductor Wafer
206
204
228
228
228
226
226
204
204
204
Sealant
Rings
234
Bellows 232
Pin Lifter Yoke
230
Insulator
240
242
Strain Gauge
DSP
250
Motor
Controller
252
Switch
236
244
Lead Screw
Variable
Resistor
238
Motor
246
Encoder
248

FIG. 2B

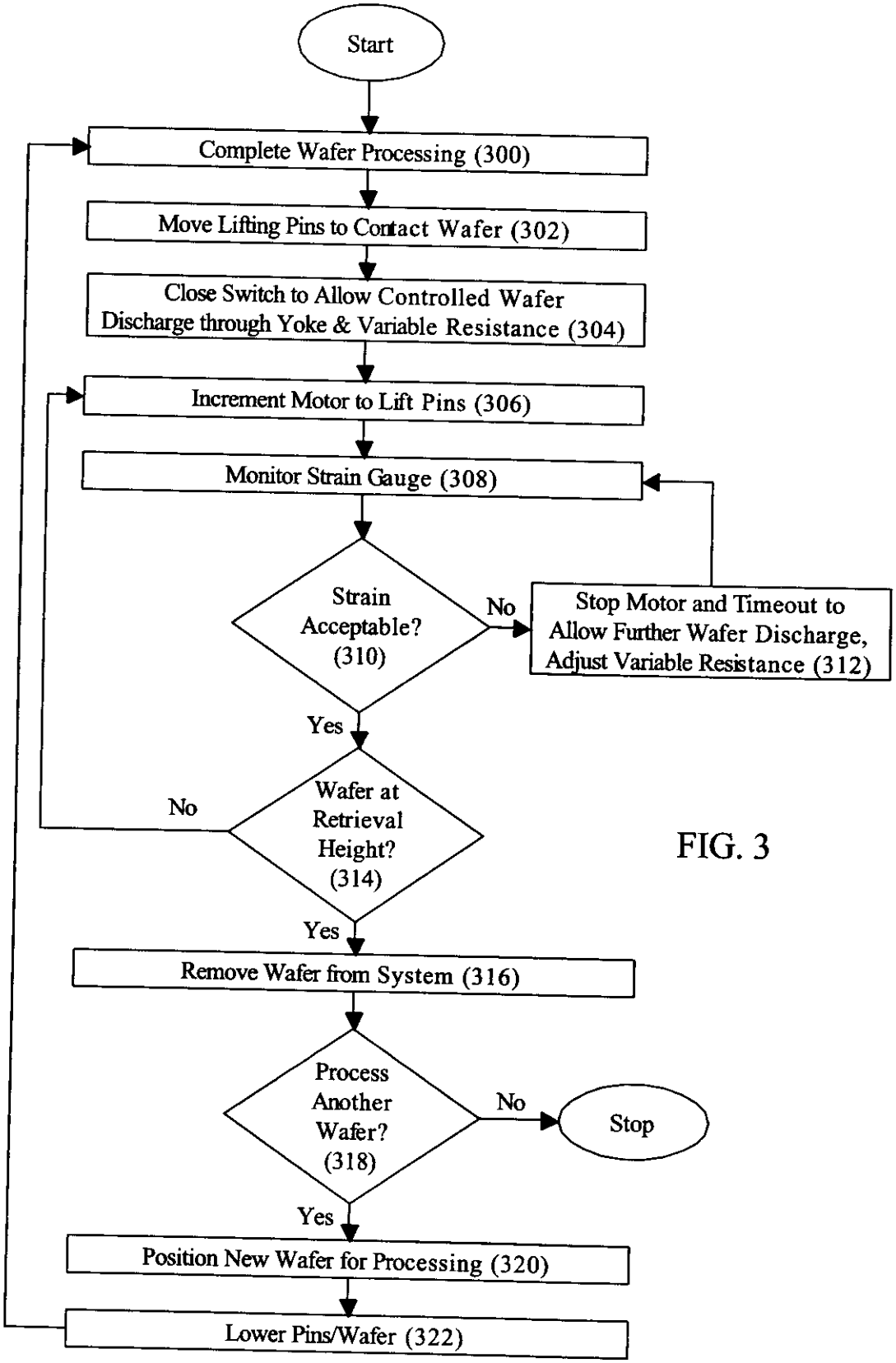

Start
Complete Wafer Processing (300)
Move Lifting Pins to Contact Wafer (302)
Close Switch to Allow Controlled Wafer Discharge through Yoke & Variable Resistance (304)
Increment Motor to Lift Pins (306)
Monitor Strain Gauge (308)
Strain Acceptable? (310)
No
Stop Motor and Timeout to Allow Further Wafer Discharge, Adjust Variable Resistance (312)
Yes
Wafer at Retrieval Height? (314)
No
Yes
Remove Wafer from System (316)
Process Another Wafer? (318)
No
Stop
Yes
Position New Wafer for Processing (320)
Lower Pins/Wafer (322)

FIG. 3